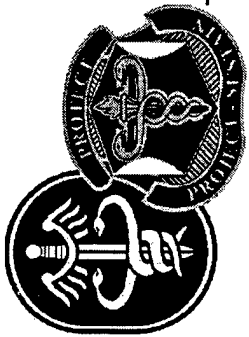


REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 24-28 May 1999		3. REPORT TYPE AND DATES COVERED	
4. TITLE AND SUBTITLE Military Deployments and Soldier Readiness				5. FUNDING NUMBERS	
6. AUTHOR(S) Castro, Carl A., Ph.D. and Adler, Amy B., Ph.D.					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Commander Attn: Medical Research Unit CMR 442 APO AE 09042				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research & Materiel Command Ft. Detrick, Frederick, MD 21702-5012				10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.				12b. DISTRIBUTION CODE	
<p>13. ABSTRACT (Maximum 200 words)</p> <p>The impact of deployment length on soldier mental health was assessed in U.S. military personnel as they re-deployed from the Bosnia-Herzegovina area of operations. All personnel completed scales measuring depression, potential alcohol abuse, and post-traumatic stress (PTSD). The mental health of the deployed force changed as a function of deployment length. After being deployed for 5 to 6 months, the percent of soldiers who scored above criterion increased for all three scales. These increases in psychological distress indicators continued at least up to 10 months. These results demonstrate (a) that the mental health status of a deployed force in support of a peacekeeping mission changes as a function of deployment length, (b) that a tour length of 4 to 6 months in the Bosnia-Herzegovina area of operations is acceptable in terms of maintaining the mental health of the deployed force, and (c) that the psychological readiness of a deployed force can be accurately and reliably measured.</p> <p>Note: Abstract is accompanied by briefing slides that MAJ Castro presented at the 35th International Applied Military Psychology Symposium (IAMPS), Firenze, Italy (24-28 May 1999).</p>					
14. SUBJECT TERMS deployment length, Bosnia-Herzegovina, depression, alcohol abuse, post-traumatic stress, soldier readiness				15. NUMBER OF PAGES	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLAS	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLAS	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLAS	20. LIMITATION OF ABSTRACT		



Military Deployments and Soldier Readiness

Major Carl A. Castro, Ph.D. & Amy B. Adler, Ph.D.
U.S. Army Medical Research Unit-Europe
Heidelberg, Germany

35th International Applied Military Psychology Symposium
Firenze, Italy
24-28 May 1999

19990708 145

27 May 1999

U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command

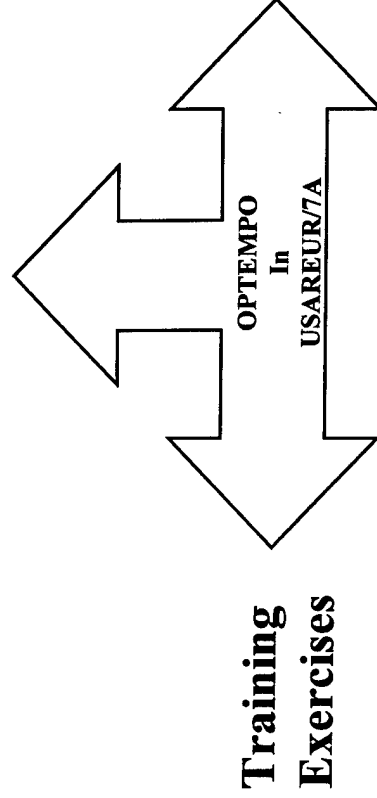
DTIC QUALITY INSPECTED 4

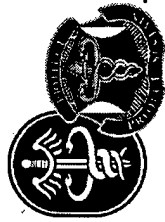


Pace of Operations: 3 Components

- **Deployments:** Peacekeeping, humanitarian, and combat.
 - including peace enforcement, TFAS, PfP, SETAF missions
- **Training/Exercises:** Field exercises, schools, and TDYs
- **Garrison Duties:** Rear detachment and garrison support

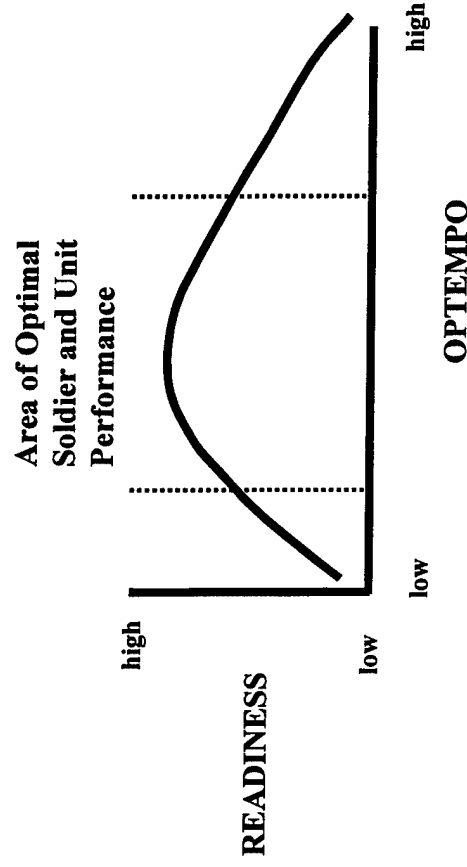
Deployments





Research Model

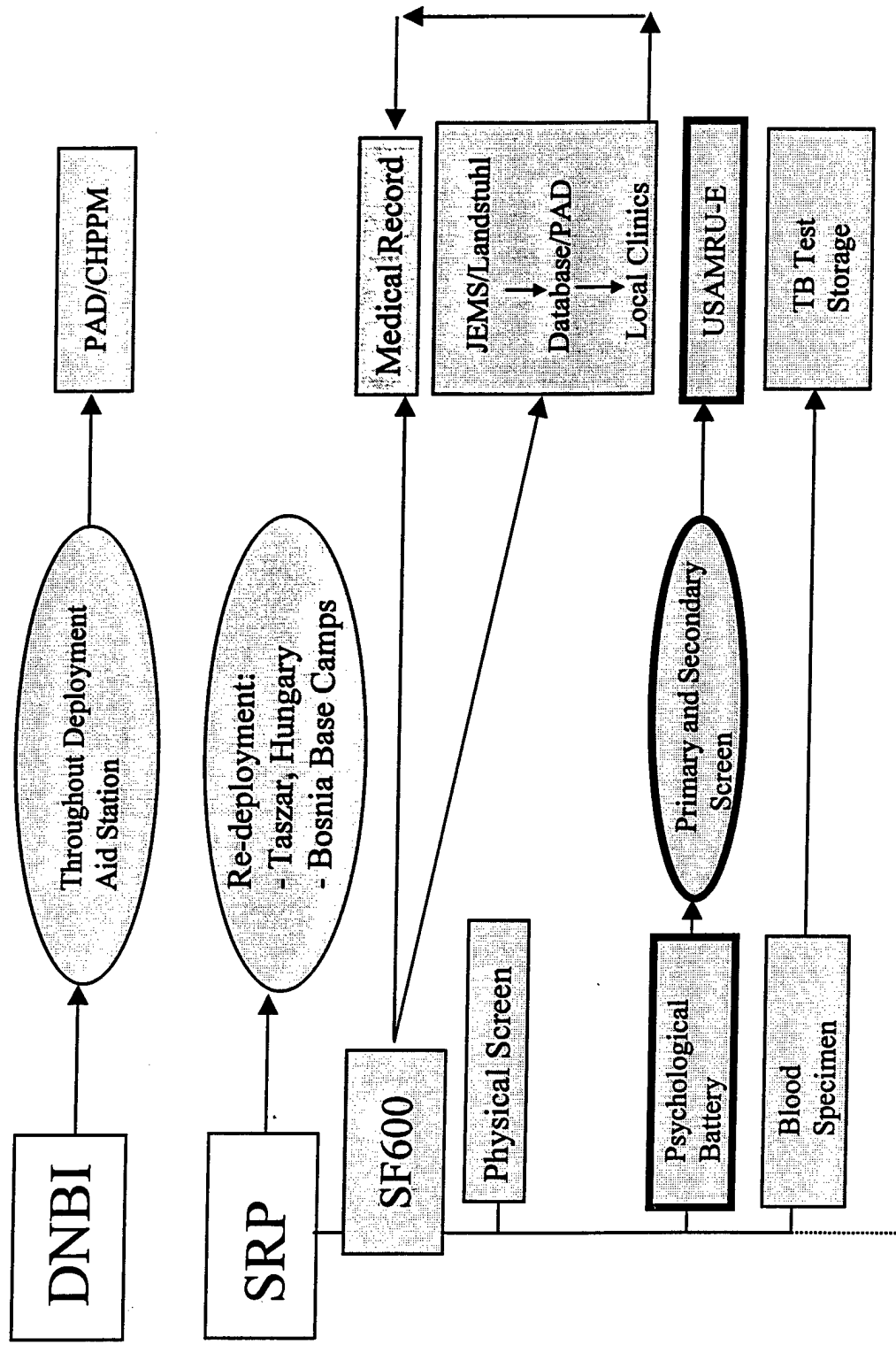
Hypothetical Relationship between OPTEMPO & Readiness

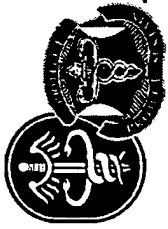


- There are levels of OPTEMPO that *enhance* unit and soldier readiness.
- There are also levels of OPTEMPO that *decrease* unit and soldier readiness.
- Military deployments, training exercises, and garrison duties are useful in maintaining soldier and unit readiness. It is only when these levels are either very high or very low that soldier and unit readiness declines.



Force Surveillance Program: Bosnia





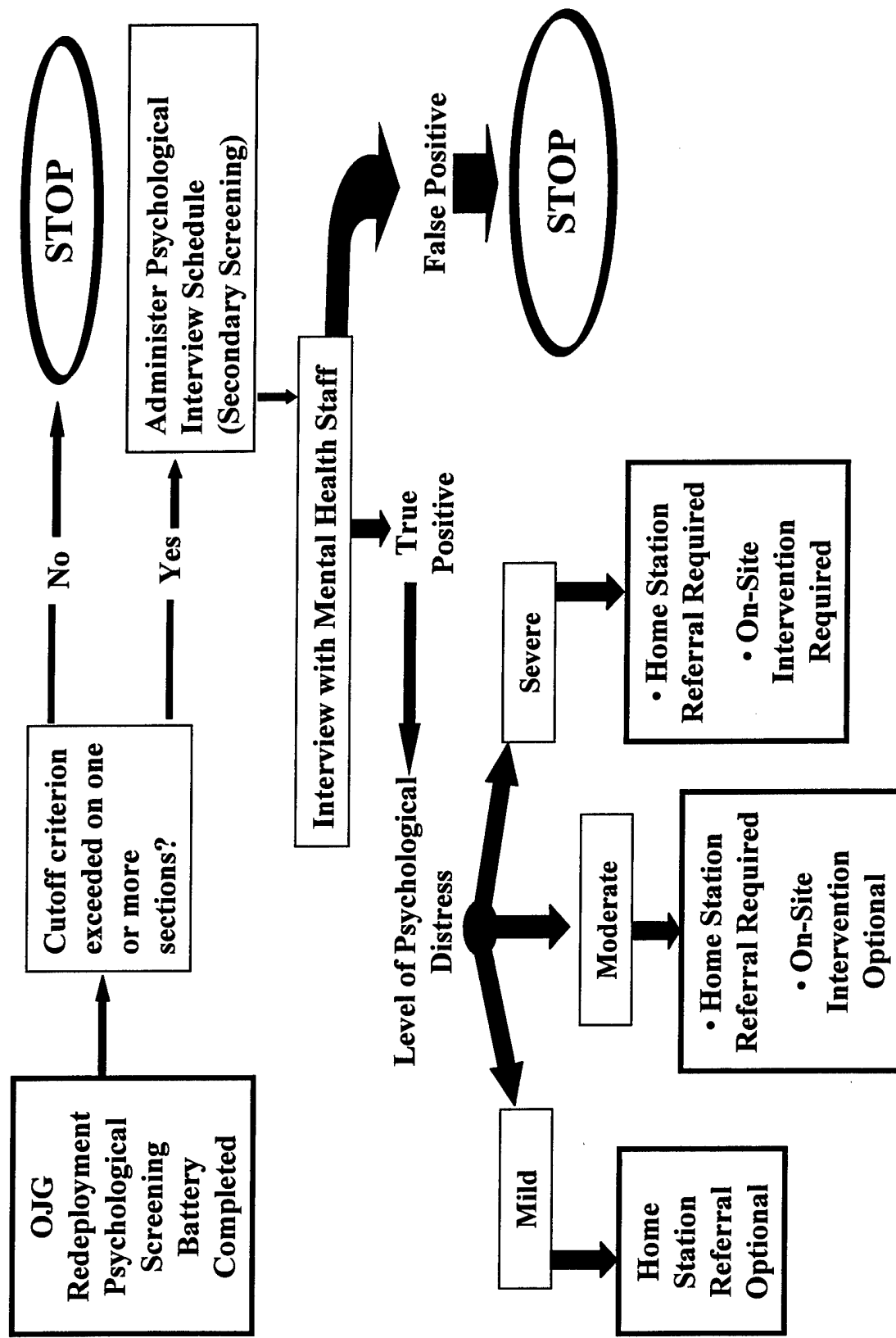
Psychological Screening Procedures

Three Components

- **Primary Screen:** Administered to all redeploying military personnel. Measures three psychological symptom categories:
 - post-traumatic stress
 - depression
 - alcohol abuse
- **Secondary Screen Interview:** Military personnel whose scores exceed established criteria on any indicator are interviewed by an appropriate clinician.
- **Home station referral:** Based on the interview, military personnel may be referred for home station follow-up. Referrals are documented in the service members' medical records.

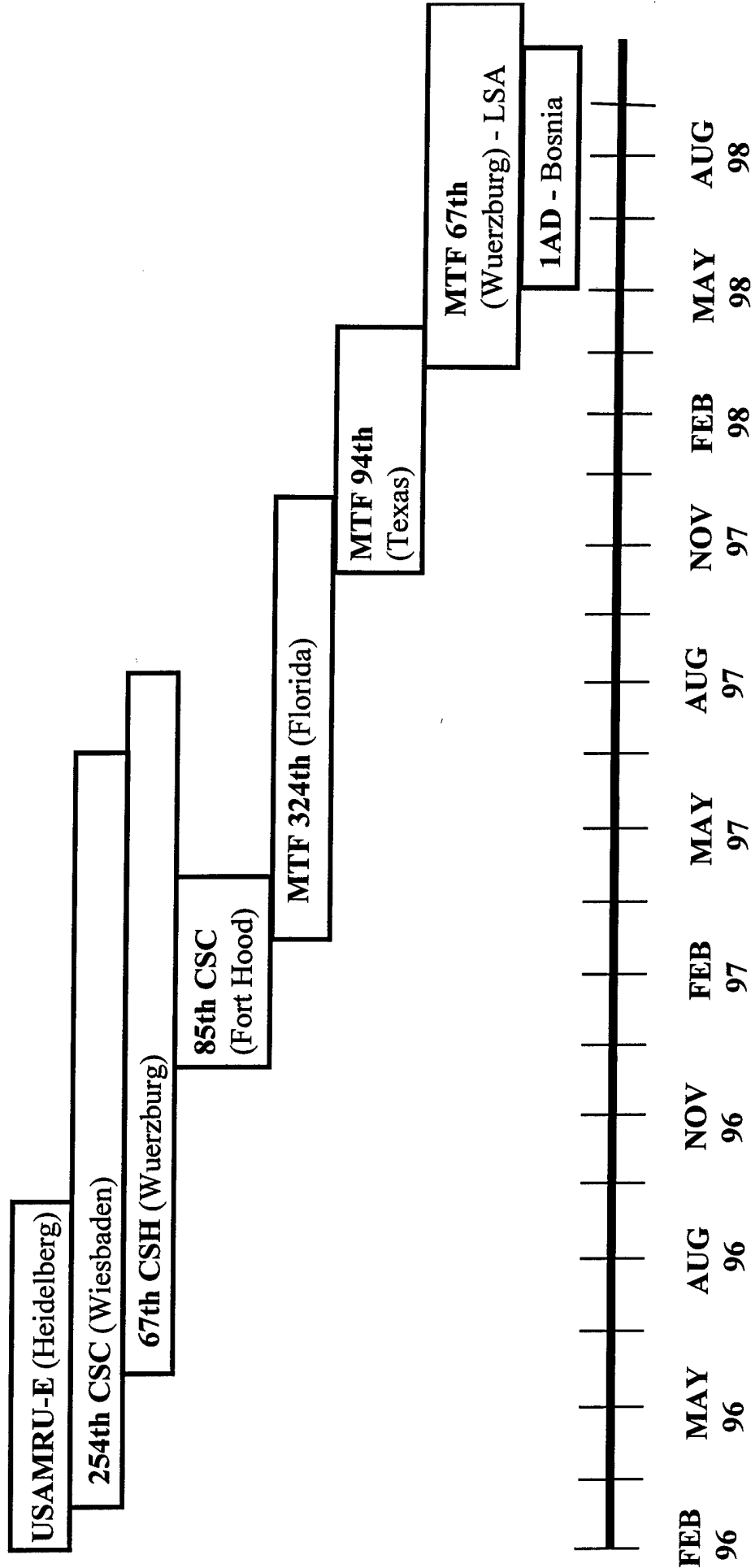


Psychological Screening Scoring Flowchart





Units Conducting Psychological Screening (1 of 2)





Units Conducting Psychological Screening (2 of 2)

1CD - Bosnia (Ft Hood, Texas)

10 ID - Bosnia (Ft Drum, New York)

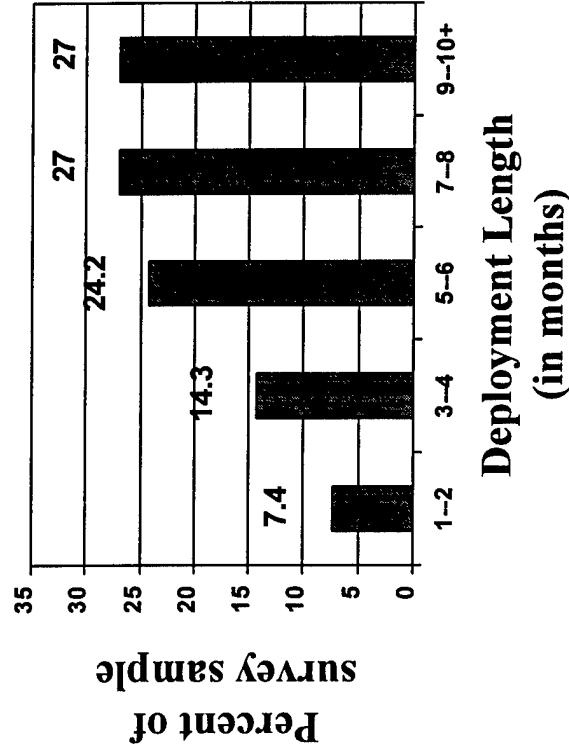
SEP 98	NOV 98	JAN 99	MAR 99	MAY 99	JUL 99	SEP 99	NOV 99	JAN 00	MAR 00	MAY 00
-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------



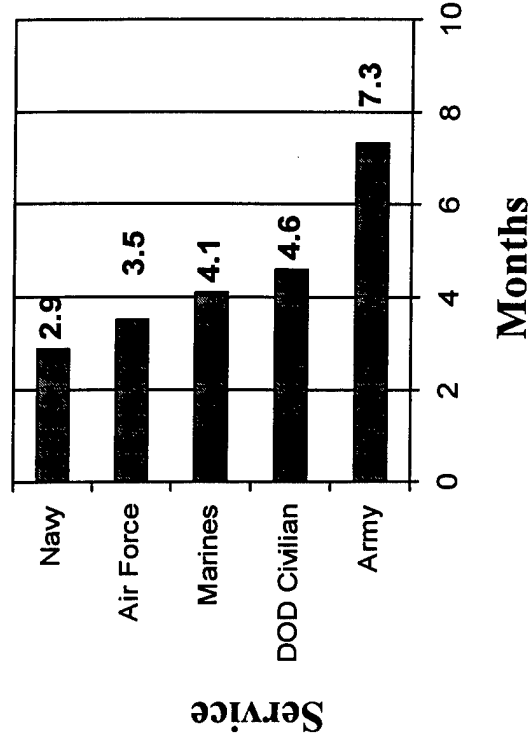
Deployment Length

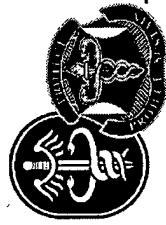
- Average deployment length for the entire force was 6.6 months.
- 27% of the force were deployed for longer than 8 months.
- The Army had the highest average deployment length in the Bosnia theater compared to all other services. The DoD civilians and the Marines had the next highest, followed by the Air Force and Navy.

Average Deployment Length



Average Deployment Length by Service

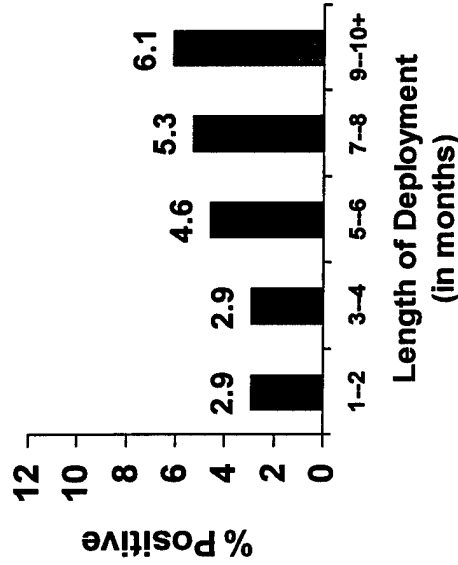




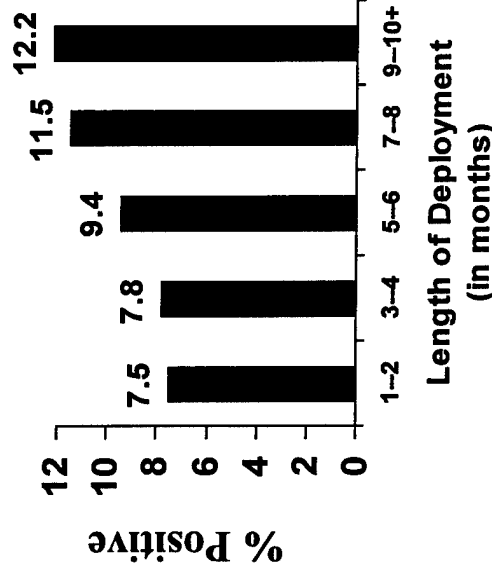
Deployment Length: Primary Screen

- Percent of total Bosnia force whose scores on the primary psychological screens (PTSD, depression, and alcohol) exceed specified criteria as a function of length of deployment.
- 19.0% of those receiving the primary screen exceeded established criteria on at least one of the scales.
- In general, the highest rates occurred among those deployed for longer than 5 months, with the first increase occurring after 5-6 months deployment.

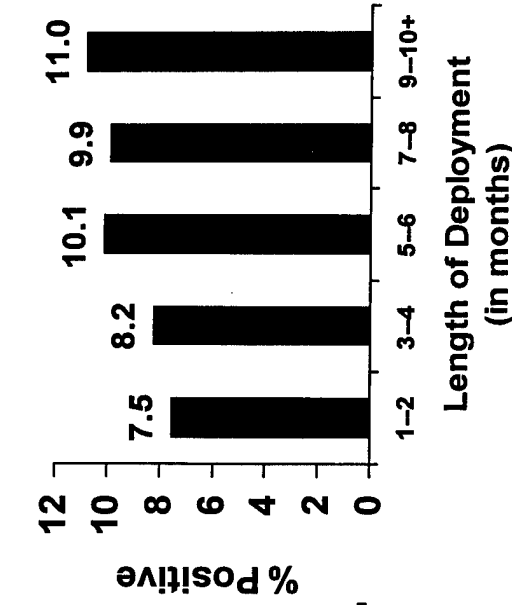
PTSD



Depression



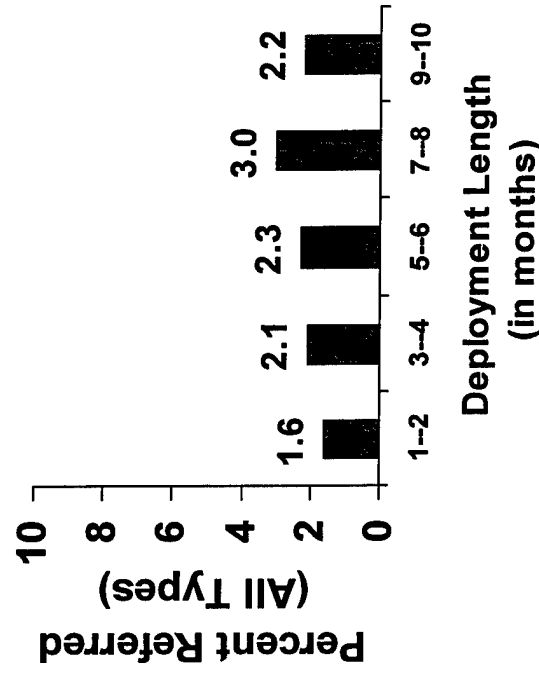
Alcohol Abuse

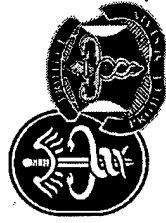




Deployment Length: Referrals

- Percent of total force referred for home station follow-up as a function of length of deployment.
- There is a peak for referral rates around 7 to 8 months of deployment. During OJE there was an increase in referrals at 5 to 6 months (with a peak of 4.4%).
- Unlike the primary screen rates, referral rates can be affected by a particular psychological battery screening team, based on differences in experience and training.





Population Incidence: Referrals

- Comparison of military referral with population rates.
- No reference data sets exist which permit a direct comparison between these redeployment military rates and other populations. *Indirect* comparisons, however, can be made between military referral rates and population diagnostic rates.
- The military referral rates for PTSD, depression, and alcohol abuse are below or within general population rates.

NOTE: The referral rates include two numbers: the first number is based on the percent of the entire population surveyed, the second number is based on the percent of the respondents receiving a secondary screen (i.e. those exceeding criteria on any one scale). The population diagnostic rates are based on the U.S. population.

	Military Referral Rate N = 35,677		Population Diagnostic Rate
	Total population	Secondary screening population	
PTSD (questions pertain only to deployment)	0.3%	1.6%	1 - 14% (general population) 3 - 58% (for at risk individuals)
Depression	1.0%	4.9%	1.7% - 3.1%
Alcohol Abuse	0.6%	3.2%	1.1% - 5.7%



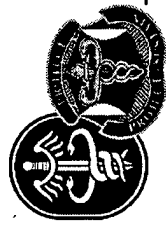
Comparison of Forces: Primary Screen

- Percent of each service (Army, Navy, Air Force, Marines, and DoD civilians) whose scores exceed established criteria on the PTSD, depression, and alcohol scales.
- The Army personnel had the highest rates on all primary scales compared with the other services followed by the Marines, Navy, Civilians, and Air Force.

	PTSD	Depression ¹	Alcohol	Total ²
Total (N = 45,898)	4.8%	10.3%	9.8%	19.0%
Army (n = 43,717)	5.0%	10.6%	9.9%	19.4%
Navy (n = 618)	2.9%	7.9%	7.6%	14.8%
Air Force (n = 1,074)	0.7%	2.5%	3.9%	6.3%
Marine (n = 198)	3.0%	7.6%	8.3%	15.6%
Civilian (n = 291)	3.4%	5.1%	7.4%	12.4%

¹ Of those scoring below criteria on depression, 1.7% endorsed an item assessing suicidal ideation.

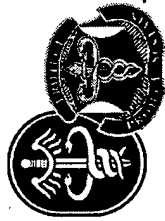
² NOTE: Numbers may not sum to 100% because of rounding.



Comparison of Forces: Secondary Screen

- Percent of each service (Army, Navy, Air Force, Marines, and DoD civilians) receiving a home station referral.
- The Army and Marines had the highest home station referral rates, followed by DoD civilians, the Navy, and the Air Force.
- Among those exceeding criteria on one of the primary scales, Civilians, Army, and Marines have the highest referral rates, whereas the Navy and Air Force had a relatively low rate of referral.

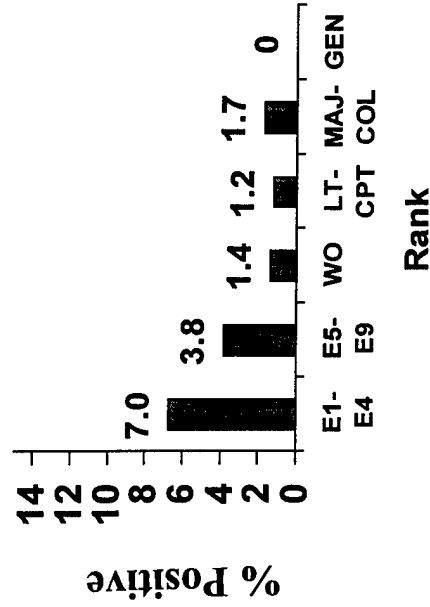
	Referred (% of total sample; n=46,444)	Referred (% of those interviewed; n=1,024)
Total (N = 45,902)	2.4% (n = 1,095)	11.8%
Army (n = 43,719)	2.4% (n = 1,067)	11.9%
Navy (n = 618)	1.1% (n = 7)	6.6%
Air Force (n = 1,074)	0.5% (n = 5)	7.6%
Marine (n = 198)	2.5% (n = 5)	10.0%
Civilian (n = 293)	1.7% (n = 5)	14.3%



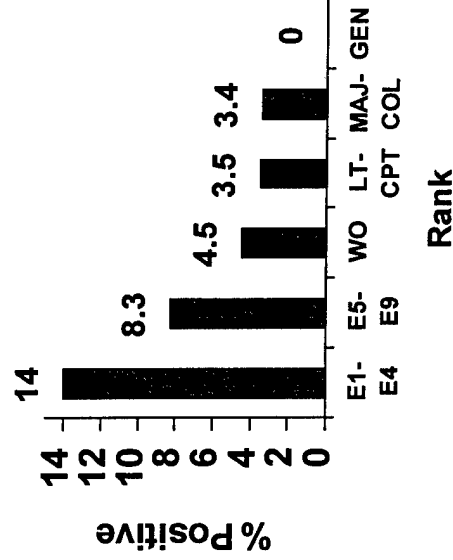
Rank Comparisons: Primary Screen

- Percent of the force in the Bosnia theater whose scores on the PTSD, depression, and alcohol scales exceed establish criteria as a function of rank.
- In general, the rates of the junior enlisted and NCOs were higher than the rates of officers on all three scales (PTSD, depression, and alcohol abuse).

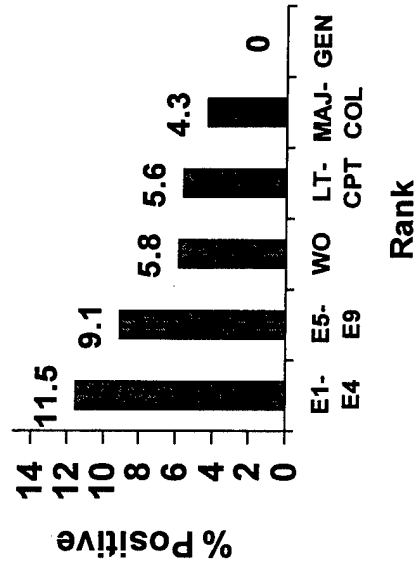
PTSD

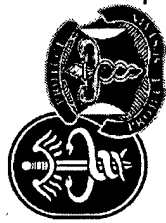


Depression



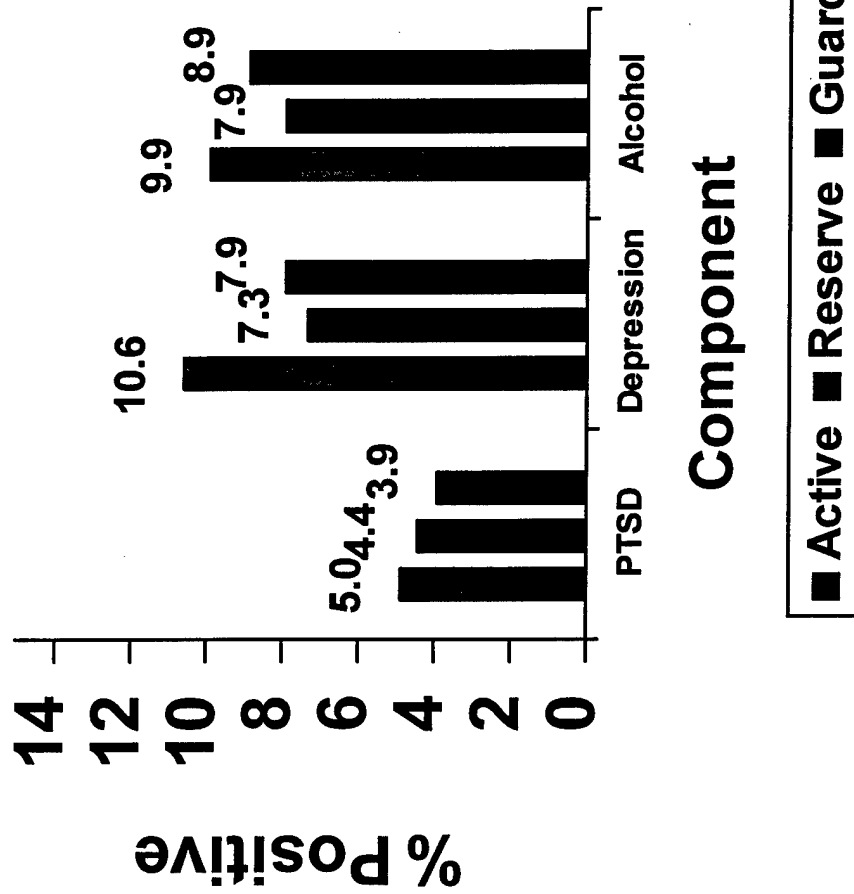
Alcohol Abuse

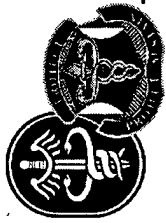




Component Comparisons: Primary Screen

- Percent of the force in the Bosnia theater whose scores on the PTSD, depression, and alcohol scales exceed established criteria as a function of component.
- In general, the rates of the active duty personnel were higher than the rates of reservists and national guard personnel on all three scales (PTSD, depression, and alcohol abuse).
- In terms of home station referral rates, the active duty and reservist personnel had higher rates (2.4% and 2.2% respectively) than the National Guard (0.9%).

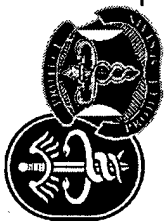




Scale Reliability

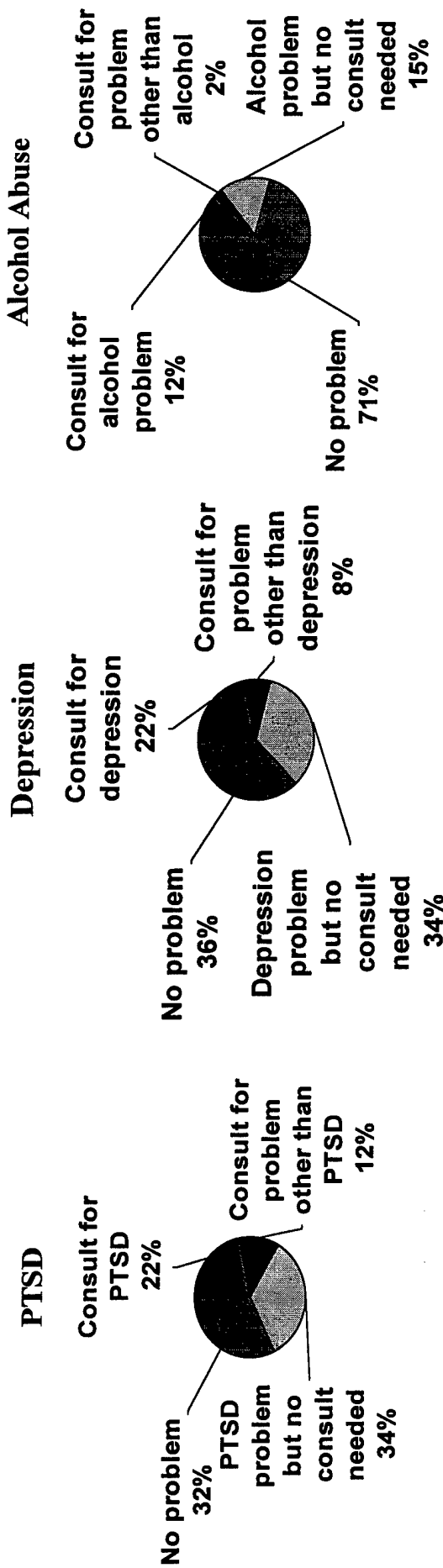
- The PTSD scale is highly reliable.
- The Zung and the CAGE, both published scales, had lower rates of reliability.

<u>SCALE</u>	<u>Chronbach's Alpha</u>
CAGE	.49
Zung	.53
PTSD	.92

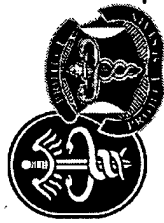


Effectiveness of Symptom Scales: Interviews

- Disposition rates¹ for military personnel scoring in the positive range on the three screening measures (PTSD, depression, and alcohol abuse).
- The PTSD and depression scales were effective in identifying redeploying personnel with problems 68% and 64% of the time, respectively; the alcohol abuse scale was effective only 29% of the time.

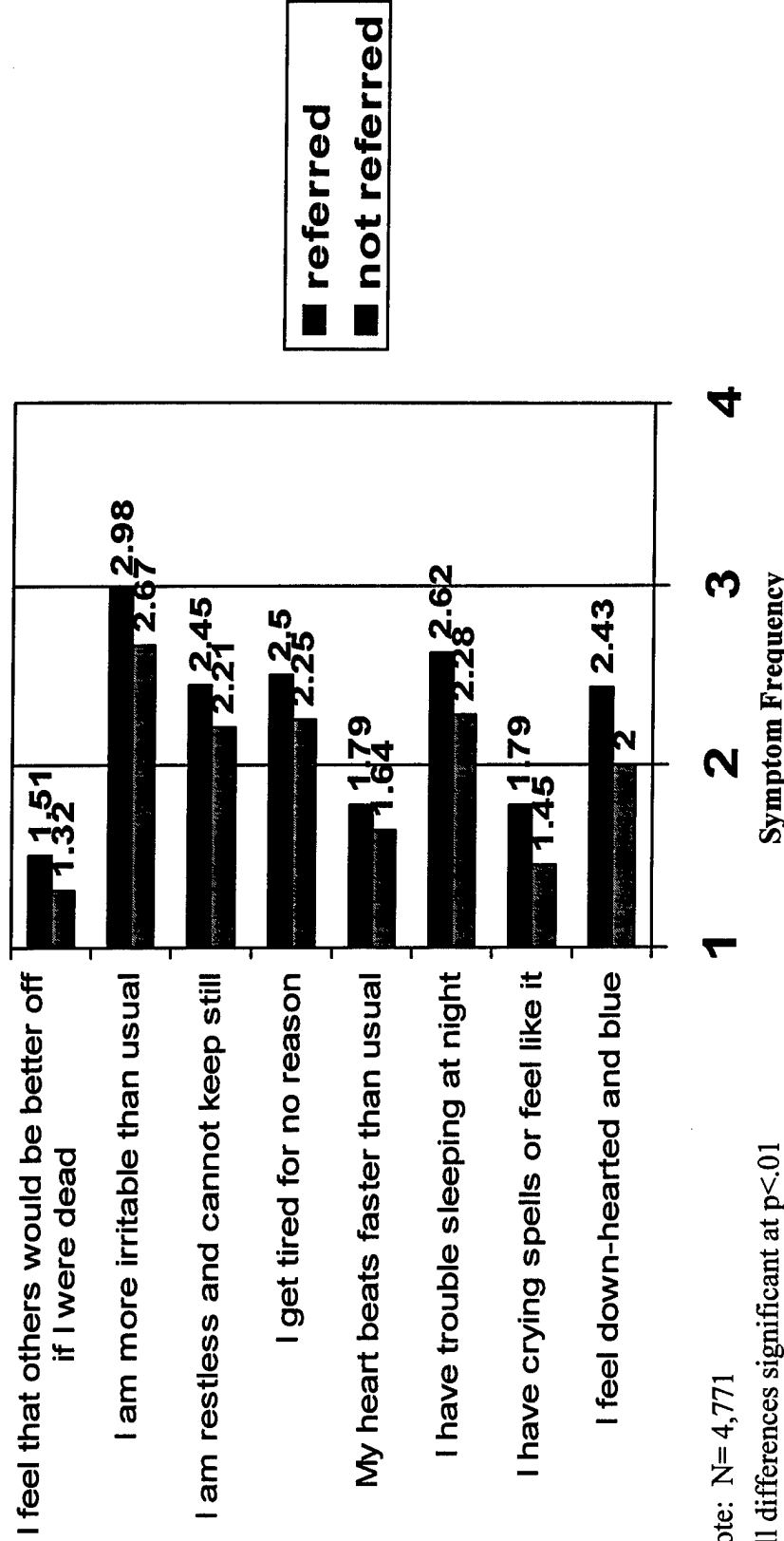


¹Case disposition breakdowns are based on 5,395 military personnel redeploying.



Analysis: Zung Depression Scale

- All items on the scale contributed to soldiers exceeding criteria on the primary screen.
- For those who exceeded criteria on the Zung, 8 items distinguished between those who got any type of referral and those who did not receive a referral.

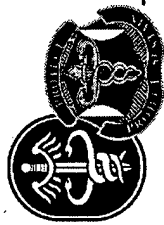


Note: N= 4,771

All differences significant at $p < .01$

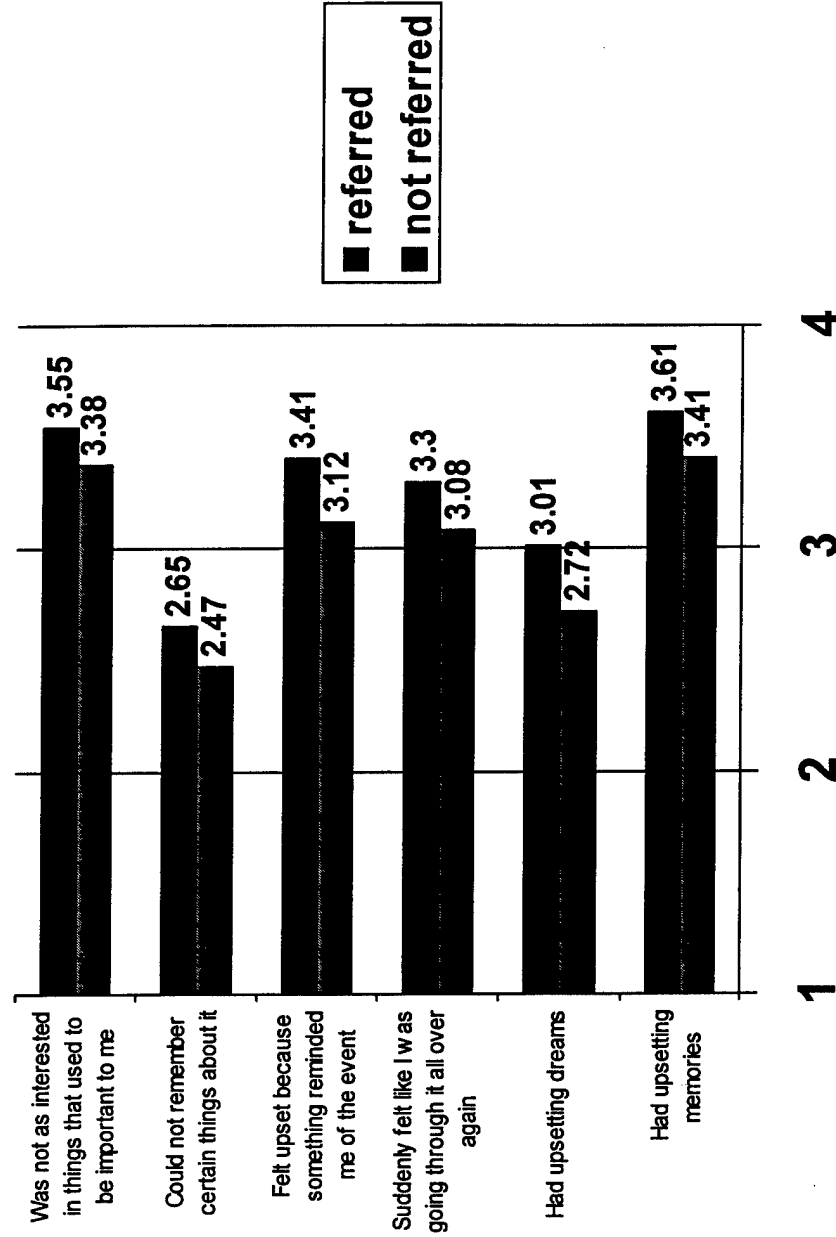
27 May 1999

U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command



Analysis: PTSD Scale (1 of 2)

- All items on the scale contributed to soldiers exceeding criteria on the primary screen.
- For those who exceeded criteria on PTSD, 11 items distinguished between those who got any type of referral and those who did not receive a referral.

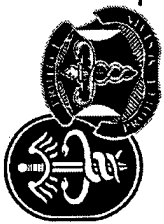


Note: N= 2,232

All differences significant at $p < .001$

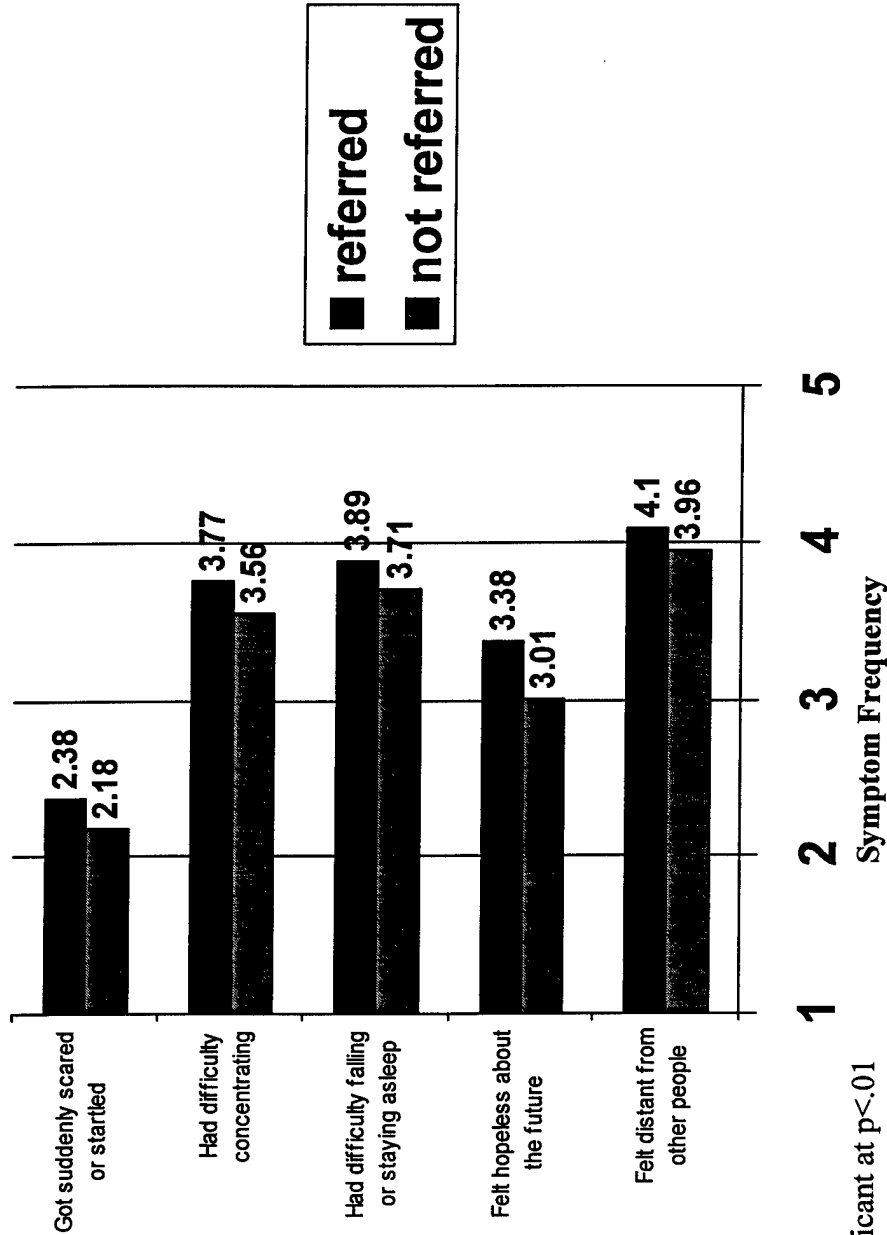
27 May 1999

U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command



Analysis: PTSD Scale (2 of 2)

- All items on the scale contributed to soldiers exceeding criteria on the primary screen.
- For those who exceeded criteria on PTSD, 11 items distinguished between those who got any type of referral and those who did not receive a referral.

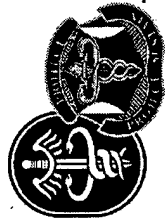


Note: N= 2,232

All differences significant at $p < .01$

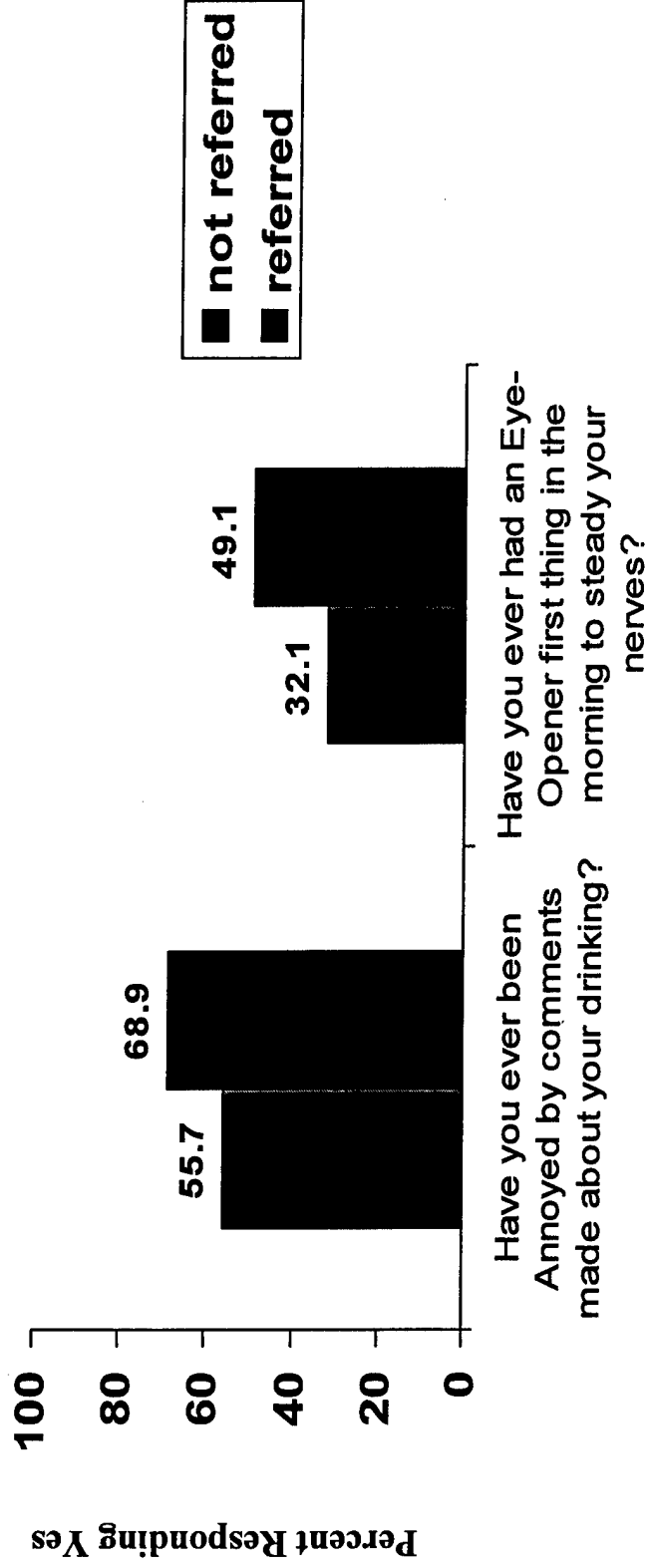
27 May 1999

U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command



Analysis: CAGE Alcohol Scale

- All items on the scale contributed to soldiers exceeding criteria on the primary screen
- For those who exceeded criteria on the CAGE, no items distinguished between those who got any type of referral and those who did not receive a referral.
- However, 2 items distinguished between those who got a referral for alcohol and those who did not.



Note: N= 4464

All differences significant at $p < .001$

27 May 1999

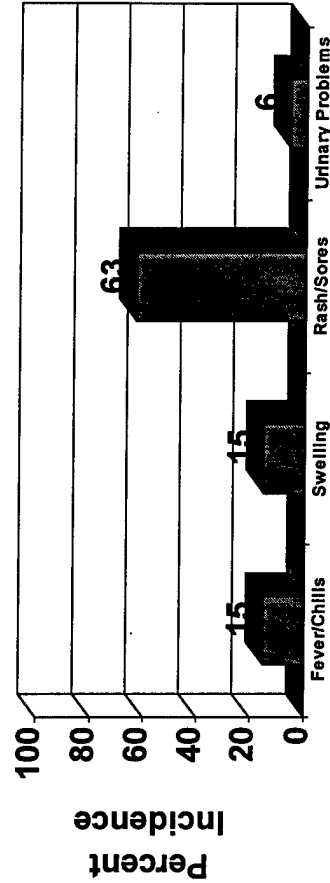
U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command



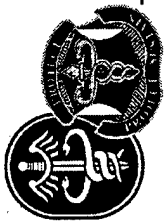
Primary Physical Screen: Incident Rates

- The majority of self-reported complaints on the SF600 were related to rashes, skin infections, or sores. The least frequently mentioned were urinary problems.
- 39% of those reporting physical problems on the SF600 reported losing at least 3 days of work during the deployment; 8% reported that they have a condition that has not been evaluated which limits their ability to do their primary military job.

Physical Symptoms



Based on on-site review of 3 days of screening in November 1997 during OJG, N=544.

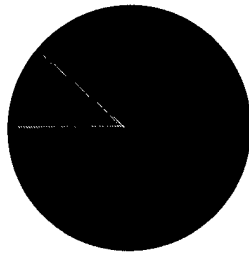


Relationship between Physical and Psychology Screens

- More personnel were identified with problems by the primary psychological screen ($n = 85$) than the primary physical screen ($n = 51$).
- Soldiers exceeding criteria on the primary psychology screen are at almost double the risk of reporting physical problems.

Negative on Psychology Screen

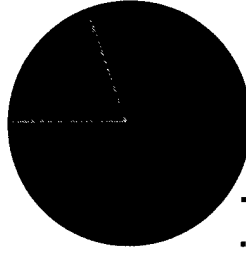
Physical Problem
12%



No Physical
Problem
88%

Positive on Psychology Screen

Physical Problem
20%

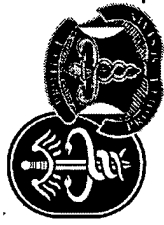


No Physical
Problem
80%

Based on on-site review of 3 days of screening in November 1997 during OJG, N=544.

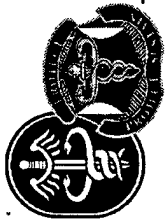
27 May 1999

U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command



Value of Psychological Data Base

- Provides the Combatant Commanders information on the mental health of the redeploying force over time
- Identifies deployment mental health issues for interventions with the follow-on force
- Projects patient load at home station mental health facilities for redeploying service members
- Establishes a reference database for comparison to future operations and follow-on operations
- Facilitates the assessment of soldiers' readiness for subsequent deployments



Conclusion

- Overall, the redeploying Bosnia force is psychologically healthy.
- Psychological screening as part of a Joint Medical Surveillance Program is feasible.
- Based on these data, the psychological health of the deployed soldier did not decline until deployed for longer than 5 months.
- The influence of demographic variables on mental health rates needs to be considered when interpreting data from selective time periods.
- Future analyses should include a comparison of unit types (i.e. Combat, Combat Support and Combat Service Support).
- New Directions
 - Refinement of Secondary Screening
 - Decentralization of Screening
 - Garrison Study
 - Lessons Learned



Point of Contact

Major Carl A. Castro
Commander

ATTN: Medical Research Unit
CMR 442

APO AE 09042-1030

Phone: DSN 371-2626/2007 FAX: DSN 371-2740

27 May 1999

U.S. Army Medical Research Unit-Europe, Walter Reed Army Institute of Research,
U.S. Army Medical Research and Materiel Command